ONEOK
ROCKIES MIDSTREAM
A SUBSIDIARY OF ONEOK PARTNERS

SUBMITTED ELECTRONICALLY

October 16, 2020

Mr. Jim Semerad
North Dakota Department of Environmental Quality
Division of Air Quality
918 E. Divide Ave, 2nd Floor
Bismarck, ND 58501-1947

ONEOK ROCKIES MIDSTREAM, L.L.C.
GARDEN CREEK GAS PLANT
PERMIT APPLICATION TO CONSTRUCT

Dear Mr. Semerad:

ONEOK Rockies Midstream, L.L.C. (ORM) operates the Garden Creek Gas Plant in McKenzie County pursuant to Title V Permit to Operate No. T5-O16001. With this submittal, ORM is requesting approval to construct a soil vapor extraction system at the facility. The proposed system is for recovery of natural gas condensate from the subsurface of the facility. This permit action will add one additional emission source to the permit.

Enclosed with this letter are NDDEQ permit forms, emissions calculations and supporting documents. If you need additional information or have any questions, please contact me at 918-732-1477 or Kale.Hanner@oneok.com.

Sincerely,

Kale Hanner
Supervisor – Environmental Compliance

Enclosures
xc: M. Carlson/J. Chrobak/K. Rudningen/D. Vande Bossche/A. Hernandez/K. Rafferty/R. Brown (.pdf)
Tulsa Environmental Files – Garden Creek Gas Plant – Permit Actions
EIMS

ONEOK ROCKIES MIDSTREAM, L.L.C.

GARDEN CREEK GAS PLANT

PERMIT TO CONSTRUCT APPLICATION

SUBMITTED TO NDDEQ DIVISION OF AIR QUALITY
OCTOBER 2020

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INTRODUCTION

Narrative Description

ONEOK Rockies Midstream, L.L.C. (ORM) currently operates the Garden Creek Gas Plant in McKenzie County. The facility currently operates under Title V Operating Permit Number T5-016001 issued on April 18, 2017. With this application for a construction application, ORM is proposing to proposes to construct a soil vapor extraction (SVE) system at the Garden Creek Gas Plant. The proposed SVE system is an engineered remedy for recovery of natural gas condensate from the shallow subsurface at the facility. Soil gas composition is expected to vary during the operation of the SVE system as a result of both flow and ambient conditions. Operation of the SVE system will involve management of the influent composition and flows to achieve project objectives with safety parameters.

The proposed SVE system consists of four integrated components: dry wells used to collect hydrocarbon-impacted soil gas from the subsurface under ambient conditions, a network of gathering tubing that convey the recovered soil gas to a central location under vacuum; an equipment building with blowers that provide vacuum to the gathering network; and an emissions control device that is used for destruction and removal of hydrocarbons in the discharge from the blowers. The SVE vapor combustion unit (FL-4) is equipped with a burner management system, a partially-enclosed refractory, and supplemental utilities so that combustion temperatures are maintained. The pilot burner is rated approximately 0.5 MMBtu/hr, and the combustion assist burner is rated 2.6 MMBtu/hr. Both burners are designed to combust natural gas.

The Facility processes sweet field gas cryogenically to separate methane from natural gas liquids. The primary products from the plant are pipeline-grade natural gas (primarily methane) and natural gas liquids (C2-C6+). The Garden Creek Gas Plant has a nominal design capacity of 300 MMSCFD (100 MMSCFD per train). The emission sources for each train includes one 61.5 MMBTU/hr hot oil heater, one 6.7 MMBTU/hr regenerator heater, one 300-bbl methanol storage tank, four low pressure condensate storage tanks, four produced water/slop oil tanks, one used oil tank, one lube oil tank, truck loading, one 1,462-hp natural gas-fired emergency generator, fugitive VOCs, one emergency/process flare, and miscellaneous emissions. ORM also operates the Garden Creek Compressor Station that is located on the adjoining property to the southeast of the plant. The natural gas processing plant and the compressor station are considered co-located facilities and are therefore both included within this operating permit

application. The emission sources for the compressor station consist of three 400-bbl condensate storage vessels controlled by a vapor recovery unit (VRU), one 210-bbl methanol storage tank, truck loading, an emergency flare, and fugitive emissions. All compression at both the gas plant and the compressor station is electrically driven.

Regulatory Applicability

New Source Performance Standards

New Source Performance Standards (NSPS) contained in 40 CFR Part 60 regulate specific new, modified, or reconstructed sources of emissions. The following is an analysis of NSPS potentially applicable to the Garden Creek Gas Plant III expansion.

Subpart Dc, Small Industrial-Commercial-Institutional Steam Generating Units. This subpart applies to each steam generating unit that is constructed, modified, or reconstructed after June 9, 1989 and has a maximum design heat input capacity of greater than or equal to 10-mmBtu/hr and less than or equal to 100-mmBtu/hr. The 50.2-mmBtu/hr hot oil heater (H-1B) will be subject to this subpart. ORM will comply with all applicable requirements.

New Source Performance Standards (NSPS) contained in 40 CFR Part 60 regulate specific new, modified, or reconstructed sources of emissions. The following is an analysis of NSPS potentially applicable to the site.

Subpart K, Ka, Kb, VOL Storage Vessels. All storage tanks at the site were constructed prior to the applicability dates for Subpart K and Subpart Ka. The storage tanks are not subject to Subpart Kb because they are below the threshold level of 19,812-gals (629-bbls). Additionally, all petroleum and condensate tanks are considered prior to custody transfer.

Subpart GG, Stationary Gas Turbines. This subpart affects turbines which commenced construction, reconstruction or modification after October 2, 1977, with a heat input at peak load of greater than or equal to 10 MMBTUH based on the lower heating value of the fuel. There is no turbine at this facility.

Subpart KKK, Equipment Leaks of VOC from Onshore Natural Gas Processing Plants. This subpart sets standards for natural gas processing plants which are defined as any site engaged in the extraction of natural gas liquids from field gas, fractionation of natural gas liquids, or both. The contract for

construction for the first train was signed prior to August 23, 2011 and signified the commencement of construction of the gas plant. Therefore, the plant is subject to this Subpart.

Subpart Dc, Standards of Performance for Heaters. The Hot Oil Heaters (H-1, H-1A, and H-1B) are rated between 10 and 100 MMBTU/hr and were constructed after 1984; as such they are affected facilities under this subpart. As the heaters only burn natural gas, the only applicable requirements are the initial notification under 40 CFR 60.7 and a monthly record of fuel type per 40 CFR 60.48c(g)(2). All other heaters are less than 10 MMBTU/hr and are not covered by any NSPS.

Subpart IIII, Stationary Compression Ignition (CI) Internal Combustion Engines (ICE). This subpart affects CI ICE manufactured after 2007. There are no CI ICE located at the Facility.

Subpart JJJJ, Stationary Spark Ignition Internal Combustion Engines (SI-ICE). This subpart promulgates emission standards for all new SI engines ordered after June 12, 2006, and all SI engines modified or reconstructed after June 12, 2006, regardless of size. Specific emission standards (either in g/hp-hr or as a concentration limit) vary based on engine class, engine power rating, lean-burn or rich-burn, fuel type, duty (emergency or non-emergency), and numerous manufacture dates. The 1,462-hp Caterpillar G3516C LE emergency generators (EGEN-1, EGEN-2, and EGEN-3) were manufactured after July 1, 2010 and are therefore subject to the standards for emergency use engines including emission limitations of 2.0 g NOx/hr, 4.0 g CO/hr and 1.0 g VOC/hr.

Subpart OOOO, Crude Oil and Natural Gas Production, Transmission and Distribution. This subpart establishes emission standards for equipment that commences construction, is modified or reconstructed on or after August 23, 2011 and on or before September 18, 2015 at crude oil and natural gas production, transmission and distribution facilities. Although construction commenced at Garden Creek's Train #1 prior to August 23, 2011, modification to portions of the inlet at Train #1 and the subsequent construction of Train #2 and Train #3 occurred after the applicability date which will result in certain equipment being subject to NSPS Subpart OOOO fugitive monitoring. Additionally, compressors associated with Trains #2 and #3 are subject to Subpart OOOO maintenance practices. Pneumatic controllers are actuated with are and are therefore not subject to this subpart. The condensate and produced water tanks at Train #1 were constructed prior to August 23, 2011 and the tanks at all three trains are limited to 6 tons/year of VOC emissions and are therefore not subject to Subpart OOOO. The tanks at Train #2 and Train #3 are listed on the North Dakota Storage Vessel Registration.

Subpart OOOOa, Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution. The emission sources affected by this subpart include well completions, pneumatic controllers, equipment leaks from natural gas processing plants, sweetening units at natural gas processing plants, reciprocating compressors, centrifugal compressors, modified compressor stations and storage vessels which are constructed, modified or reconstructed after September 18, 2015. Modifications have occurred at the facility after the applicability date. Therefore, the facility has process units subject to Subpart OOOOa.

National Emissions Standards for Hazardous Air Pollutants Applicability

The project is not subject to current National Emission Standards for Hazardous Air Pollutants (NESHAP) under 40 CFR Part 61. However, Maximum Achievable Control Technology (MACT) standards under 40 CFR Part 63 may apply.

Subpart HH, Oil and Natural Gas Production Facilities. This subpart applies to affected emission points that are located at facilities that are major and area sources of HAP, and either process, upgrade, or store hydrocarbon liquids prior to custody transfer or that process, upgrade, or store natural gas prior to entering the natural gas transmission and storage source category. For purposes of this subpart natural gas enters the natural gas transmission and storage source category after the natural gas processing plant, if present. The facility is a minor (area) source of HAP; however, there will be no triethylene glycol (TEG) dehydration unit present at the facility and therefore this subpart does not apply

Subpart ZZZZ, Reciprocating Internal Combustion Engines (RICE). The original rule, published on February 26, 2004, initially affected new (constructed or reconstructed after December 19, 2002) reciprocating internal combustion engines (RICE) with a site-rating greater than 500 brake horsepower (HP) located at a major source of HAP emissions. On January 18, 2008, EPA published an amendment that promulgated standards for RICE constructed or reconstructed after June 12, 2006 with a site rating less than or equal to 500 HP located at major sources, and for engines constructed and reconstructed after June 12, 2006 located at area sources. On August 10, 2010, EPA published another amendment that promulgated standards for existing (constructed or reconstructed before June 12, 2006) RICE at area sources and existing RICE (constructed or reconstructed before June 12, 2006) with a site rating of less than or equal to 500 HP at major sources. Based on emissions calculations, this facility is a minor source of HAP. The

generator has not yet been purchased, but it is presumed to have been constructed after June 12, 2006 and thus will comply with this subpart by compliance with NSPS Subpart JJJJ.

Subpart DDDDD, Industrial, Commercial and Institutional Boilers and Process Heaters. This subpart establishes national emission limitations and work practice standards for hazardous air pollutants (HAP) emitted from industrial, commercial, and institutional boilers and process heaters located at major sources of HAP. This subpart also establishes requirements to demonstrate initial and continuous compliance with the emission limitations and work practice standards. This facility is not a major source of HAP.

Subpart JJJJJJ, Industrial, Commercial and Institutional Boilers at Area Sources. This subpart establishes national emission limitations and work practice standards for hazardous air pollutants (HAP) emitted from industrial, commercial, and institutional boilers located at area sources of HAP. Gas-fired boilers are exempt from this subpart. All equipment at this facility will be fueled by natural gas; therefore, this subpart does not apply.

40 CFR Part 98 – Mandatory Reporting Of Greenhouse Gases

Subpart A – General Provisions/Subpart C – General Stationary Fuel Combustion Sources

The Mandatory Reporting of Greenhouse Gases rule requires reporting of annual emissions of CO_2, CH_4, N_2O, SF_6, HFCs, PFCs, and other fluorinated gases in metric tons. The GHG reporting requirements and related monitoring, recordkeeping, and reporting requirements of this part apply to the owners and operators of any facility that is located in the United States or under or attached to the Outer Continental Shelf and that meets the requirements of either paragraph (a)(1), (a)(2), or (a)(3) of Subpart A; and any supplier that meets the requirements of paragraph (a)(4) of this Subpart A.

This facility will not contain any source categories listed in paragraph (a)(1) or (a)(2), and is not a supplier of products listed in paragraph (a)(4). If the facility does not meet the requirements of either paragraph (a)(1) or (a)(2), and the aggregate maximum rated heat input capacity of the stationary fuel combustion units at the facility is 30 mmBtu/hr or greater, and the facility has the potential to emit 25,000 metric tons CO_2e or more per year in combined emissions from all stationary fuel combustion sources, the facility is required to report under Subpart C for General Stationary Fuel Combustion Sources. The facility has an aggregate maximum rated heat input capacity of greater than 30 mmBtu/hr and potential emissions are

greater than 25,000 metric tons CO_2e; therefore, the facility is subject to requirements under these subparts.

40 CFR Part 98 Subpart W – Petroleum and Natural Gas Systems

Under this subpart, the source category consists of emission sources in the following segments of the petroleum and natural gas industry: Onshore petroleum and natural gas production, offshore petroleum and natural gas production, onshore natural gas processing plants, onshore natural gas transmission compression, underground natural gas storage, liquefied natural gas (LNG) storage, liquefied natural gas import and export equipment, and natural gas distribution.

The facility is considered one of the affected source categories and is subject to this subpart.

State Requirements

Certain NDDEQ air quality rules will also be applicable to the Facility. ORM will operate the facility in compliance with applicable federal and state air quality regulations.

NDDEQ APPLICATION FORMS

Form SFN 8516, Air Contaminant Sources Permit Application

Form SFN 8520, Permit Application for Manufacturing or Processing Equipment

Form SFN 8532, Permit Application for Air Pollution Control Equipment

Form SFN 8329, Permit Application for Hazardous Air Pollution Sources

NDDEQ APPLICATION FORMS

Form SFN 8516, Air Contaminant Sources Permit Application

Form SFN 8520, Permit Application for Manufacturing or Processing Equipment

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Form SFN 8329, Permit Application for Hazardous Air Pollution Sources

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Form SFN 8516, Air Contaminant Sources Permit Application

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Form SFN 8532, Permit Application for Air Pollution Control Equipment

Form SFN 8329, Permit Application for Hazardous Air Pollution Sources

PERMIT APPLICATION FOR AIR CONTAMINANT SOURCES

NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF AIR QUALITY
SFN 8516 (3-2019)

SECTION A - FACILITY INFORMATION

Name of Firm or Organization ONEOK Rockies Midstream, L.L.C.		
Applicant's Name Dick J. Vande Bossche		
Title Vice President - ONEOK Rockies Midstream Operations	Telephone Number 918-588-7839	E-mail Address dick.vandebossche@oneok.com
Contact Person for Air Pollution Matters Kale Hanner		
Title Supervisor - Environmental Compliance	Telephone Number 918-732-1477	E-mail Address kale.hanner@oneok.com
Mailing Address (Street & No.) 100 W. Fifth Street		
City Tulsa	State OK	ZIP Code 74103
Facility Name Garden Creek Gas Plant		
Facility Address (Street & No.) 3007 121st Avenue NW		
City Watford City	State ND	ZIP Code 58854

County McKenzie	Latitude (Nearest Second) 47.84935	Longitude (Nearest Second) -103.17687

Legal Description of Facility Site

Quarter	Quarter	Section	Township	Range
	SE	35	151N	98W

Land Area at Facility Site 80 Acres (or) Sq. Ft.	MSL Elevation at Facility 2040 ft.

SECTION B – GENERAL NATURE OF BUSINESS

Describe Nature of Business	North American Industry Classification System Number	Standard Industrial Classification Number (SIC)
Natural Gas Processing	211130	1321

SECTION C – GENERAL PERMIT INFORMATION

Type of Permit? ☒ Permit to Construct (PTC) ☐ Permit to Operate (PTO)

If application is for a Permit to Construct, please provide the following data:

Planned Start Construction Date October 2020	Planned End Construction Date November 2020

SECTION D – SOURCE IDENTIFICATION AND CATEGORY OF EACH SOURCE INCLUDED ON THIS PERMIT APPLICATION

		Permit to Construct				Minor Source Permit to Operate						
Your Source ID Number	Source or Unit (Equipment, Machines, Devices, Boilers, Processes, Incinerators, Etc.)	New Source	Existing Source Modification	Existing Source Expansion	Existing Source Change of Location	New Source	Existing Source Initial Application	Existing Source After Modification	Existing Source After Expansion	Existing Source After Change of Location	Existing Source After Change of Ownership	Other
FL-4	SVE Vapor Combustion Unit	X										

Add additional pages if necessary

SECTION D2 – APPLICABLE REGULATIONS

Source ID No.	Applicable Regulations (NSPS/MACT/NESHAP/etc.)
Facility-wide	NSPS JJJJ, NSPS KKK, NSPS OOOO, NSPS Dc
FL-4	N/A

SECTION E – TOTAL POTENTIAL EMISSIONS

Pollutant	Amount (Tons Per Year)
NO_x	2.24
CO	5.27
PM	13.85

Pollutant	Amount (Tons Per Year)
PM_{10} (filterable and condensable)	0.10
$PM_{2.5}$ (filterable and condensable)	0.10
SO_2	0.01
VOC	13.85
GHG (as CO_2e)	3,672.5
Largest Single HAP	1.83
Total HAPS	1.84

*If performance test results are available for the unit, submit a copy of test with this application. If manufacturer guarantee is used provide spec sheet.

SECTION F1 – ADDITIONAL FORMS

Indicate which of the following forms are attached and made part of the application	
☒ Air Pollution Control Equipment (SFN 8532)	☐ Fuel Burning Equipment Used for Indirect Heating (SFN 8518)
☐ Construct/Operate Incinerators (SFN 8522)	☒ Hazardous Air Pollutant (HAP) Sources (SFN 8329)
☐ Natural Gas Processing Plants (SFN 11408)	☒ Manufacturing or Processing Equipment (SFN 8520)
☐ Glycol Dehydration Units (SFN 58923)	☐ Volatile Organic Compounds Storage Tank (SFN 8535)
☐ Flares (SFN 59652)	☐ Internal Combustion Engines and Turbines (SFN 8891)
☐ Grain, Feed, and Fertilizer Operations (SFN 8524)	☐ Oil/Gas Production Facility Registration (SFN 14334)

SECTION F2 – OTHER ATTACHMENTS INCLUDED AS PART OF THIS APPLICATION

1.	Potential to Emit Calculations	4.	Facility Plot Plan
2.	Plant Process Flow Diagram	5.	
3.	Area Map	6.	

I, the undersigned applicant, am fully aware that statements made in this application and the attached exhibits and statements constitute the application for Permit(s) to Construct and/or Operate Air Contaminant sources from the North Dakota Department of Environmental Quality and certify that the information in this application is true, correct and complete to the best of my knowledge and belief. Further, I agree to comply with the provisions of Chapter 23.1-06 of the North Dakota Century Code and all rules and regulations of the Department, or revisions thereof. I also understand the permit is nontransferable and, if granted a permit, I will promptly notify the Department upon sale or legal transfer of this permitted establishment.

Signature	Date
DocuSigned by: Dick Vande Bossche 96A29333B8D94C9...	10/16/2020

INSTRUCTIONS

SITE PLANS TO BE ATTACHED TO APPLICATION:

Prepare and attach a plot plan drawn to scale or properly dimensioned, showing at least the following:

a. The property involved and the outlines and heights of all buildings on the property. Identify property lines plainly. Also, indicate if there is a fence around the property that prevents public access.

b. Location and identification of all existing or proposed equipment, manufacturing processes, etc., and points of emission or discharge of air contaminants to the atmosphere.

c. Location of the facility or property with respect to the surrounding area, including residences, businesses and other permanent structures, streets and roadways. Identify all such structures and roadways. Indicate direction (**NORTH**) on the drawing and the prevailing wind direction.

EQUIPMENT PLANS AND SPECIFICATIONS FOR PERMIT TO CONSTRUCT:

Supply plans and specifications, including as a minimum an assembly drawing, dimensioned and to scale, in plan, elevation and as many sections as are needed to show clearly the design and operation of the equipment and the means by which air contaminants are controlled.

The following must be shown:

a. Size and shape of the equipment. Show exterior and interior dimensions and features.

b. Locations, sizes, and shape details of all features which may affect the production, collection, conveying, or control of air contaminants of any kind, location, size, and shape details concerning all material handling equipment.

c. All data and calculations used in selecting or designing the equipment.

d. Horsepower rating of all internal combustion engines driving the equipment.

NOTE: **STRUCTURAL DESIGN CALCULATIONS AND DETAILS ARE NOT REQUIRED.** WHEN STANDARD COMMERCIAL EQUIPMENT IS TO BE INSTALLED, THE MANUFACTURER'S CATALOG DESCRIBING THE EQUIPMENT MAY BE SUBMITTED IN LIEU OF ITEMS a, b, c, and d OF ABOVE, WHICH THE CATALOG COVERS. ALL INFORMATION REQUIRED ABOVE THAT THE CATALOG DOES NOT CONTAIN MUST BE SUBMITTED BY THE APPLICANT.

ADDITIONAL INFORMATION MAY BE REQUIRED:

If the application is signed by an authorized representative of the owner, a LETTER OF AUTHORIZATION must be attached to the application.

SEND COMPLETED APPLICATION AND ALL ATTACHMENTS TO:

North Dakota Department of Environmental Quality
Division of Air Quality
918 E Divide Avenue, 2nd Floor
Bismarck, ND 58501-1947
(701) 328-5188

PERMIT APPLICATION FOR MANUFACTURING OR PROCESSING EQUIPMENT

NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF AIR QUALITY
SFN 8520 (3-2019)

NOTE: READ INSTRUCTIONS BEFORE COMPLETING THIS FORM.
- Must include SFN 8516 or SFN 52858

SECTION A – GENERAL INFORMATION

Equipment items operating as a functional unit may be grouped as one application	
Name of Firm or Organization ONEOK Rockies Midstream, L.L.C.	Facility Name Garden Creek Gas Plant

SECTION B – EQUIPMENT INFORMATION

Source ID Number (From SFN 8516) FL-4		
Type of Unit or Process (rotary dryer, cupola furnace, crusher, pelletizer, etc.) Soil Vapor Extraction (SVE) System		
Make	Model	Date Installed October 2020
Capacity (manufacturer's or designer's guaranteed maximum)	Operating Capacity (specific units)	
Brief description of operation of unit or process: The SVE system is designed for recovery of natural gas condensate from the shallow subsurface at the facility and is equipped with a vapor combustion unit.		

SECTION C – NORMAL OPERATING SCHEDULE

Hours Per Day	Days Per Week	Weeks Per Year	Peak Production Season (if any)	Dates of Annual Shutdown
24	7	52		

SECTION D – RAW MATERIALS INTRODUCED INTO UNIT OR PROCESS

Include solid fuels such as coke or coal. *Exclude* indirect heat exchangers from this section
For indirect heat exchangers, complete form SFN 8518

Material	Hourly Process Weight (Pounds Per Hour)			Average Annual (Specify Units)	Intermittent Operation Only (Average Hours Per Week)
	Average	Maximum	Minimum		
N/A					

SECTION E – PRODUCTS OF UNIT OR PROCESS

Include all, even those not usable because they do not meet specifications

Material	Hourly Process Weight (Pounds Per Hour)			Average Annual (Specify Units)	Intermittent Operation Only (Average Hours Per Week)
	Average	Maximum	Minimum		
N/A					

SECTION F – FUELS USED

Coal (Tons/Yr)	% Sulfur	% Ash	Oil (Gal/Yr)	% Sulfur	Grade No.
Natural Gas (Thousand CF/Yr) 3,679		LP Gas (Gal/Yr)		Other (Specify)	

SECTION G – EMISSION POINTS

List each point separately, number each and locate on attached flow chart

Number	Stack Height (ft)	Stack Diameter (ft at top)	Gas Volume (ACFM)	Exit Temp (°F)	Gas Velocity (fps)
FL-4	40	5	TBD	TBD	TBD

SECTION H – AIR CONTAMINANTS EMITTED

Known or Suspected - Use same identification number as above

Number	Pollutant	Amount		Basis of Estimate
		Pounds/Hr	Tons/Yr	
	NOx	0.51	2.24	Throughput/AP-42
	CO	1.20	5.27	Throughput/AP-42
	VOC	3.16	13.85	Throughput/Dest. Eff.
	HAP	0.42	1.84	Throughput/Dest. Eff.

SECTION I – VOLATILE ORGANIC COMPOUNDS

Are any volatile organic compounds (VOCs) stored on premises? ☐ No ☐ Yes – List Below
See 40 CFR 51.100(s) for classes of compounds covered

Material Stored	Size Tank (Gallons)	Vapor Control Device
N/A		

SECTION J – ORGANIC SOLVENTS

Are any organic solvents used or produced? ☐ No (None or less than 50 gal/yr) ☐ Yes – List Below

Type	Principal Use	Gallons/Yr Consumed	Gallons/Yr Produced
N/A			

SECTION K – AIR POLLUTION CONTROL EQUIPMENT

Is any air pollution control equipment installed on this unit or process? ☐ No ☑ Yes
If 'Yes' attach form SFN 8532

SECTION L – MATERIAL STORAGE

Does the input material or product from this process contain finely divided material which could become airborne? ☐ No ☐ Yes

Describe storage methods used:

N/A

Storage Piles	Type of Material	Particle Diameter (Avg. or Screen Size)	Pile Size Average Tons	Pile Wetted	Pile Covered

Describe any fugitive dust problems:

Attach additional sheets if needed to explain any answers. Use separate form for each contaminant emitting process

SEND COMPLETED APPLICATION AND ALL ATTACHMENTS TO:

North Dakota Department of Environmental Quality
Division of Air Quality
918 E Divide Avenue, 2nd Floor
Bismarck, ND 58501-1947
(701)328-5188

PERMIT APPLICATION FOR AIR POLLUTION CONTROL EQUIPMENT

NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF AIR QUALITY
SFN 8532 (3-2019)

NOTE: READ INSTRUCTIONS BEFORE COMPLETING THIS FORM.
- Must also include forms SFN 8516 or SFN 52858

SECTION A – GENERAL INFORMATION

Name of Firm or Organization	Facility Name
ONEOK Rockies Midstream, L.L.C.	Garden Creek Gas Plant

Source ID No. of Equipment being Controlled
FL-4

SECTION B – EQUIPMENT

Type: ☐ Cyclone ☐ Multiclone ☐ Baghouse ☐ Electrostatic Precipitator
☐ Wet Scrubber ☐ Spray Dryer ■ Flare/Combustor
☐ Other – Specify:

Name of Manufacturer	Model Number	Date to Be Installed
Zeeco	SD-8839	Oct/Nov 2020

Application:
☐ Boiler ☐ Kiln ☐ Engine ■ Other – Specify:

Pollutants Removed	VOC	n-Hexane		
Design Efficiency (%)	98%	98%		
Operating Efficiency (%)	98%	98%		

Describe method used to determine operating efficiency:
SVE system will be equipped with an interlock, preventing the combustor from operating when a flame is not present.

SECTION CD – GAS CONDITIONS

Gas Conditions			Inlet	Outlet
Gas Volume (SCFM; 68°F; 14.7 psia)			See emissions calculations	
Gas Temperature (°F)				
Gas Pressure (in. H_2O)				
Gas Velocity (ft/sec)				
Pollutant Concentration (Specify Pollutant and Unit of Concentration)	Pollutant	Unit of Concentration		
	VOC	N/A		
	n-Hexane	N/A		

Pressure Drop Through Gas Cleaning Device (in. H_2O)
N/A

INSTRUCTIONS FOR PERMIT APPLICATION FOR AIR POLLUTION CONTROL EQUIPMENT

1. Complete this form for each piece of equipment or process, which has air pollution control equipment installed, described in the following Permit Applications: Hazardous Air Pollutant (HAP) Sources (SFN 8329), Fuel Burning Equipment for Indirect Heating (SFN 8518); Manufacturing or Processing Equipment (SFN 8520); Incinerators/Crematories (SFN 8522); Internal Combustion Engines and Turbines (SFN 8891); and Glycol Dehydration Units (SFN 58923). Print or type all information. If an item does not apply, place NA in the appropriate space.

2. Type of Equipment - If the type is not one of those listed; provide enough information so the operating principal of the equipment can be determined.

3. List each pollutant which the device is intended to control, the efficiency of removal intended by the designer, and the actual efficiency under operating conditions.

4. Please attach the following:

   - A brief description and sketch of the air pollution control device if it is of unusual design or used in conjunction with other control devices. Show any bypass of the device and specify the conditions under which the bypass is used.

   - A description of what is done with collected air contaminants from the time they are collected until they reach the final disposal point. Include a description of the transportation methods used.

   - If a stack test has been conducted, attach a copy of the results, date of the test, a description of the techniques used, and the name and address of the organization which performed the test.

5. If the control device is a combustor (e.g.: thermal oxidizer, vapor combustion unit, etc.), include an estimate of potential greenhouse gas emissions (CO_2e).

SUBMIT YOUR APPLICATION WITH ALL SUPPORTING DOCUMENTS, ALONG WITH THE FORMS SPECIFIED IN THE FIRST PARAGRAPH ABOVE, TO:

North Dakota Department of Environmental Quality
Division of Air Quality
918 E Divide Avenue, 2nd Floor
Bismarck, ND 58501-1947
(701) 328-5188

PERMIT APPLICATION FOR HAZARDOUS AIR POLLUTANT (HAP) SOURCES

NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF AIR QUALITY
SFN 8329 (3-2019)

SECTION A1 - APPLICANT INFORMATION

Name of Firm or Organization ONEOK Rockies Midstream, L.L.C.		
Applicant's Name Dick J. Vande Bossche		
Title Vice President - ONEOK Rockies Midstream Operations	Telephone Number 918-588-7839	E-mail Address dick.vandebossche@oneok.com
Mailing Address (Street & No.) 100 W. Fifth Street		
City Tulsa	State OK	ZIP Code 74103

SECTION A2 - FACILITY INFORMATION

Contact Person for Air Pollution Matters Kale Hanner		
Title Supervisor - Environmental Compliance	Telephone Number 918-732-1477	E-mail Address kale.hanner@oneok.com
Facility Address (Street & No. or Lat/Long to Nearest Second) 3007 121st Avenue NW		
City Watford City	State ND	ZIP Code 58854
County McKenzie	Number of Employees at Location 50	
Land Area at Plant Site 80 Acres (or) _____ Sq. Ft.	MSL Elevation at Plant 2040 ft.	

Describe Nature of Business/Process

Natural Gas Processing

SECTION B – STACK DATA

Inside Diameter (ft) 5	Height Above Grade (ft) 40	
Gas Temperature at Exit (°F) >1,400	Gas Velocity at Exit (ft/sec) TBD	Gas Volume (scfm) TBD
Basis of any Estimates (attach separate sheet if necessary) Estimated throughput of extracted vapors/estimated composition of vapors		
Are Emission Control Devices in Place? If YES – Complete SFN 8532	(●) Yes	( ) No
Nearest Residences or Building Residence	Distance (ft) ~10,000 ft	Direction SW
Nearest Property Line Facility	Distance (ft) ~1,200 ft	Direction E

SECTION C – EMISSION STREAM DATA

Source ID No. From SFN 8516 FL-4	Mean Particle Diameter (um) N/A
Flow Rate (scfm) 420	Drift Velocity (ft/sec) N/A
Stream Temperature (°F) TBD	Particulate Concentration (gr/dscf) N/A
Moisture Content (%) N/A	Halogens or Metals Present? No
Pressure (in. Hg) N/A	Organic Content (ppmv) 660
Heat Content (Btu/scfm) N/A	O_2 Content (%) N/A

SECTION D – POLLUTANT SPECIFIC DATA
(Complete One Box for Each Pollutant in Emission Stream)

Pollutant Emitted n-Hexane	Chemical Abstract Services (CAS) Number 110-54-3
Proposed Emission Rate (lb/hr) 0.42	Emission Source (describe) Soil Vapor Extraction Unit
Source Classification (process point, process fugitive, area fugitive) Process Point	Pollutant Class and Form (organic/inorganic - particulate/vapor) Organic/Vapor
Concentration in Emission Stream (ppmv) N/A	Vapor Pressure (in. Hg @ °F) 153
Solubility N/A	Molecular Weight (lb/lb-mole) 86.18
Absorptive Properties	

Pollutant Emitted	Chemical Abstract Services (CAS) Number
Proposed Emission Rate (lb/hr)	Emission Source (describe)
Source Classification (process point, process fugitive, area fugitive)	Pollutant Class and Form (organic/inorganic - particulate/vapor)
Concentration in Emission Stream (ppmv)	Vapor Pressure (in. Hg @ °F)
Solubility	Molecular Weight (lb/lb-mole)
Absorptive Properties	

(Add additional pages if necessary)

Signature of Applicant DocuSigned by: Dick Vande Bossche 96A29333B8D94C9...	Date 10/16/2020

SEND COMPLETED APPLICATION AND ALL ATTACHMENTS TO:

North Dakota Department of Environmental Quality
Division of Air Quality
918 E Divide Avenue, 2nd Floor
Bismarck, ND 58501-1947
(701) 328-5188

APPENDIX A – TABLES AND DIAGRAMS

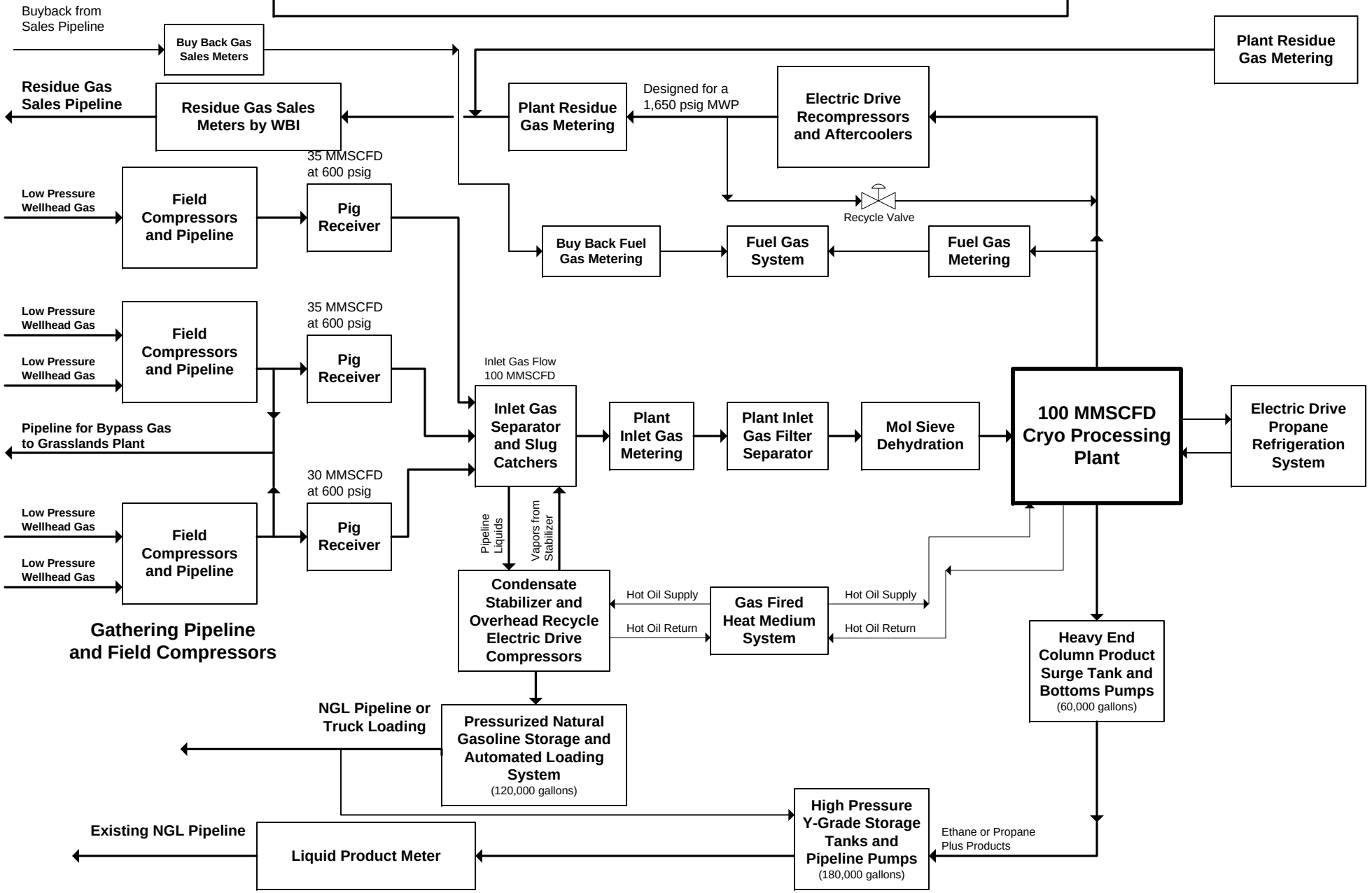
Figure 1: Process Flow Diagram

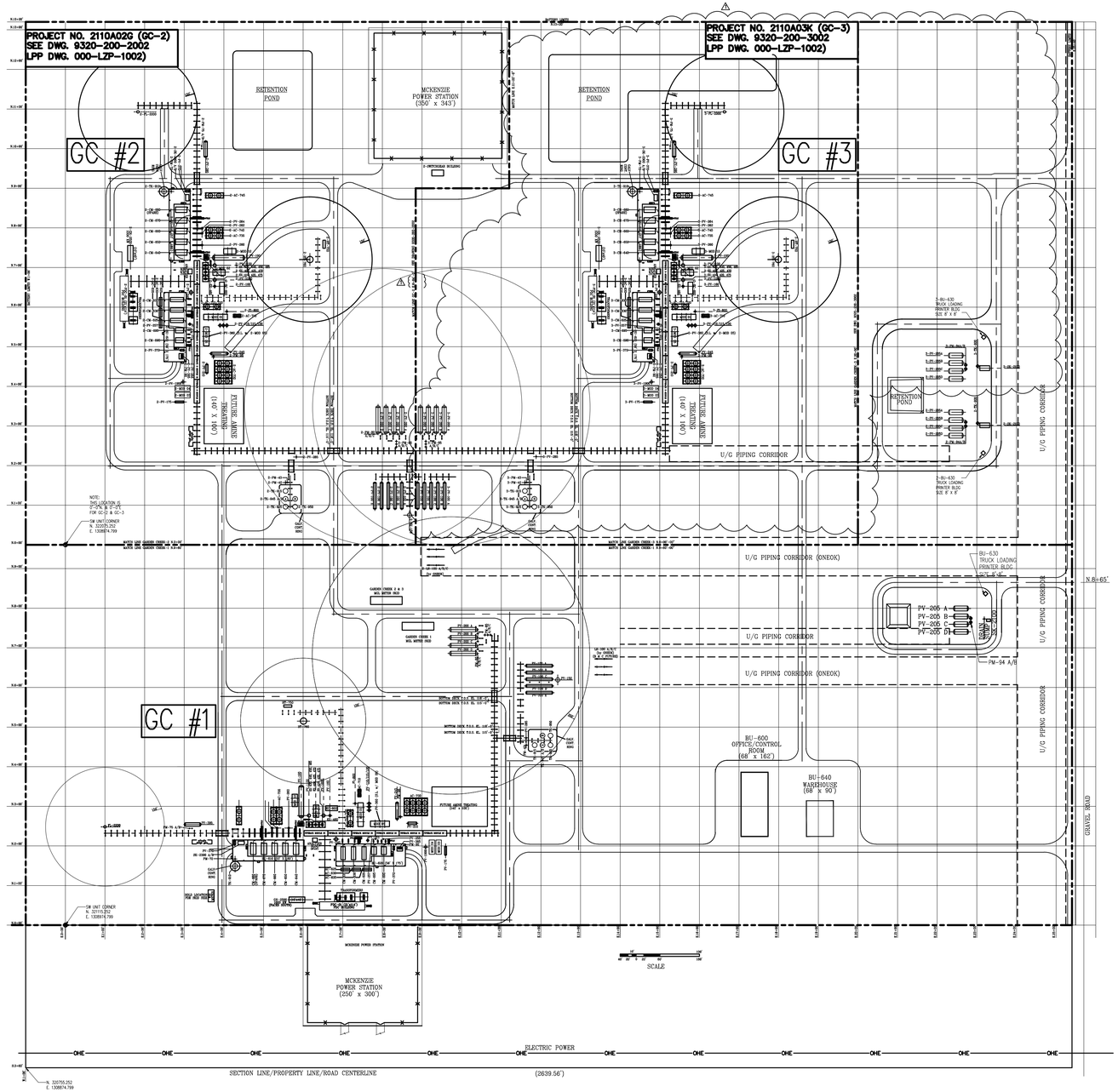
Figure 2: Facility Plot Plan

Figure 3: Area Map

Garden Creek Gas Plant
Process Diagram of Each Train (3 Total)
October 2020

ONEOK





MODULE EQUIPMENT LEGEND

MODULE 01 – PROCESS MODULE

CM-620 A/B	REGENERATION GAS COMPRESSORS (B=SPARE)
FI-810 A/B	INLET DUST FILTERS
PV-130	REGENERATION GAS SCRUBBER

MODULE 02 – PUMP MODULE

PM-10 A/B	LEFC BOTTOMS PUMPS
PM-45	METHANOL INJECTION PUMP
PV-380	METHANOL VESSEL

MODULE 03 – STABILIZER MODULE NO. 1

EX-507	SLUG CATCHER LIQUID HEATER
EX-515	FEED/BOTTOMS EXCHANGER
FI-865 A/B	STABILIZER COARSE FILTERS
FI-870 A/B	STABILIZER CLAY FILTERS
FI-890 A/B	STABILIZER FINE FILTERS

MODULE 04 – STABILIZER MODULE NO. 2

EX-520 A/B	STABILIZER REBOILERS

MODULE 05 – HOT OIL MODULE

EX-505 A/B	FEED GAS HEATER
EX-555	FUEL GAS HEATER
HE-555	START-UP FUEL GAS HEATER
FI-815 A/B	INLET GAS FILTERS
PM-90 A/B	HOT OIL PUMPS
PV-140	FUEL GAS SCRUBBER
PV-360	HOT OIL EXPANSION TANK (S.L.)

MODULE 06 – REFRIGERATION MODULE

PV-220	REFRIGERANT DISENGAGING VESSEL

MODULE 07 – REFRIGERATION MODULE

PV-225	REFRIGERANT DISENGAGING VESSEL

MODULE 08 – REFRIGERATION MODULE

PV-230	REFRIGERANT DISENGAGING VESSEL

MODULE 12 – HEFC PUMP MODULE

PM-25 A/D	HEFC BOTTOM PUMPS

MODULE 20 THRU 25 – PIPERACK MODULES (NO EQUIPMENT)

OFF-MODULE EQUIPMENT LEGEND

AC-625	REFRIGERATION COMPRESSOR COOLER
AC-630	REFRIGERATION COMPRESSOR COOLER
AC-635	REFRIGERATION COMPRESSOR COOLER
AC-710	REGENERATION GAS COOLER
AC-715	EXPANDER/COMPRESSOR DISCHARGE COOLER
AC-720	PRODUCT COOLER
AC-730	REFRIGERANT CONDENSER
AC-735	RESIDUE GAS COMPR. 1st STAGE DISCH COOLER
AC-740	RESIDUE GAS COMPR. 2nd STAGE DISCH COOLER
AC-745	RESIDUE GAS COMPR. 3rd STAGE DISCH COOLER
CM-625	REFRIGERATION COMPRESSORS
CM-630	REFRIGERATION COMPRESSORS
CM-635	REFRIGERATION COMPRESSORS
CM-640	RESIDUE GAS COMPRESSOR
CM-650	RESIDUE GAS COMPRESSOR
CM-660	RESIDUE GAS COMPRESSOR
CM-670	RESIDUE GAS COMPRESSOR
CM-680	RESIDUE GAS COMPRESSOR (SPARE)
CM-690	STABILIZER OVERHEAD COMPRESSOR
CM-695	STABILIZER OVERHEAD COMPRESSOR
EC-600	EXPANDER/COMPRESSOR
PLATEFIN	
EX-430	HEFC SIDE HEATER
EX-440	HEFC REBOILER
EX-450	PRODUCT EXCHANGER
EX-465	FEED GAS CHILLER
PLATEFIN	
EX-400	GAS/GAS EXCHANGER
EX-425	REGENERATION GAS EXCHANGER
EX-470	FEED GAS CHILLER
PLATEFIN	
EX-410	COLD GAS/GAS EXCHANGER
EX-420	SUB-COOLER
EX-475	REFRIGERANT COOLER
EX-460	TRIM REBOILER
FI-800	INLET GAS FILTER SEPARATOR
FL-2200	FLARE
GN-2500	GENERATOR
HT-750	REGENERATION GAS HEATER
HT-760	HOT OIL HEATER
LR-100 A/C	PIG RECEIVERS (B & C FUTURE) (BY ONEOK)
PM-42	METHANOL PUMP
PM-43	METHANOL TRANSFER PUMP
PM-72	LUBE OIL PUMP
PM-75 A/B	FLARE LIQUIDS PUMPS
PM-80 A/C	PRODUCT BOOSTER PUMPS
PM-85 A/C	PRODUCT PIPELINE PUMPS
PM-92	SLOP WATER PUMP
PM-94 A/B	CONDENSATE PUMP
PM-98	PROPANE MAKEUP PUMP
PV-100 A/E	FEED GAS SLUG CATCHERS
PV-110	DEHYDRATOR
PV-115	DEHYDRATOR
PV-120	DEHYDRATOR
PV-150	INLET GAS RECEIVER
PV-160	COLD SEPARATOR
PV-175	STABILIZER FEED SEPARATOR
PV-190	PRODUCT SURGE TANK
PV-200 A/D	PRODUCT STORAGE VESSEL
PV-205 A/D	CONDENSATE STORAGE VESSEL
PV-210	REFRIGERANT SURGE VESSEL
PV-215	REFRIGERANT ECONOMIZER
PV-240	LOW STAGE SUCTION SCRUBBER
PV-245	PROPANE MAKEUP VESSEL
PV-255	STABILIZER OVERHEAD SCRUBBER
PV-257	FLASH GAS SCRUBBER
PV-260	RESIDUE GAS 1st STAGE SUCTION SCRUBBER
PV-262	RESIDUE GAS 2nd STAGE SUCTION SCRUBBER
PV-264	RESIDUE GAS 3rd STAGE SUCTION SCRUBBER
PV-285	INTERMEDIATE FLASH VESSEL
PV-365	SLOP WATER VESSEL
PV-370	LUBE OIL DAY TANK
PV-372	LUBE OIL DAY TANK
PV-395	FLARE SEPARATOR
PV-1000	LIGHT ENDS FRACTIONATION COLUMN (LEFC)
PV-1100	HEAVY ENDS FRACTIONATION COLUMN (HEFC)
PV-1900	STABILIZER
SK-2100	TRUCK LOADING SKID
SK-2300 A/B	INSTRUMENT AIR PACKAGE
TK-910	LUBE OIL STORAGE TANK w/ ZZ-910
TK-920	PCC DOUBLE WALL TANK
TK-915	METHANOL TANK
TK-925	USED OIL TANK w/ ZZ-925
TK-945 A/B	SLOP WATER TANKS w/ ZZ-945 A/B
TK-950	SLOP TANK

BUILDINGS

BU-600	OFFICE/CONTROL ROOM
BU-610	RESIDUE GAS COMPRESSOR BUILDING
BU-620	REFRIGERANT COMPRESSOR BUILDING
BU-630	TRUCK LOADING PRINTER BUILDING
BU-980	ANALYZER BUILDING
PDC-01	PDC BUILDING
BU-640	WAREHOUSE

Linde Process Plants, Inc.

PROJECT NO. 2110A02G

LPP DWG. 000-LZP-1001

STATUS	ISSUE
H	4

REVISIONS

NO.	DATE	DESCRIPTION	BY	CHD	APRD
A	12/17/12	ISSUE CLIENT FOR APPROVAL	DMD	ETM	ETM
B	01/24/13	APPROVED FOR DETAILED ENGINEERING (GC-3)	RBU	ETM	ETM
0	03/13/13	AFC	RBU	ETM	ETM
1	05/09/13	ADDED GC-3 TO OVERALL PLAN FOR DETAILED ENGINEERING	RBU	JAS	ETM

QTR /4 | TWNSP | RNGE | SEC | INITIAL POINT | BLK NAME | BLK No

SURVEY NAME | SURV No | ABSTRACT NAME | ABSTRACT No

DRW BY | DRW DATE | DES BY | APRD BY | SURVEY BY:

PROJECT NAME | SCALE: NONE

AFE NO.: | CAD. NO.:

ORIGINAL DWG BY:

ORIGINAL DWG #:

DWG. NO.: 9320-000-0001 | REV. 1

ONEOK PARTNERS

ONEOK Rockies Midstream, L.L.C.

OVERALL PLOT PLAN
LIQUID RECOVERY UNITS

GARDEN CREEK | McKENZIE COUNTY, ND

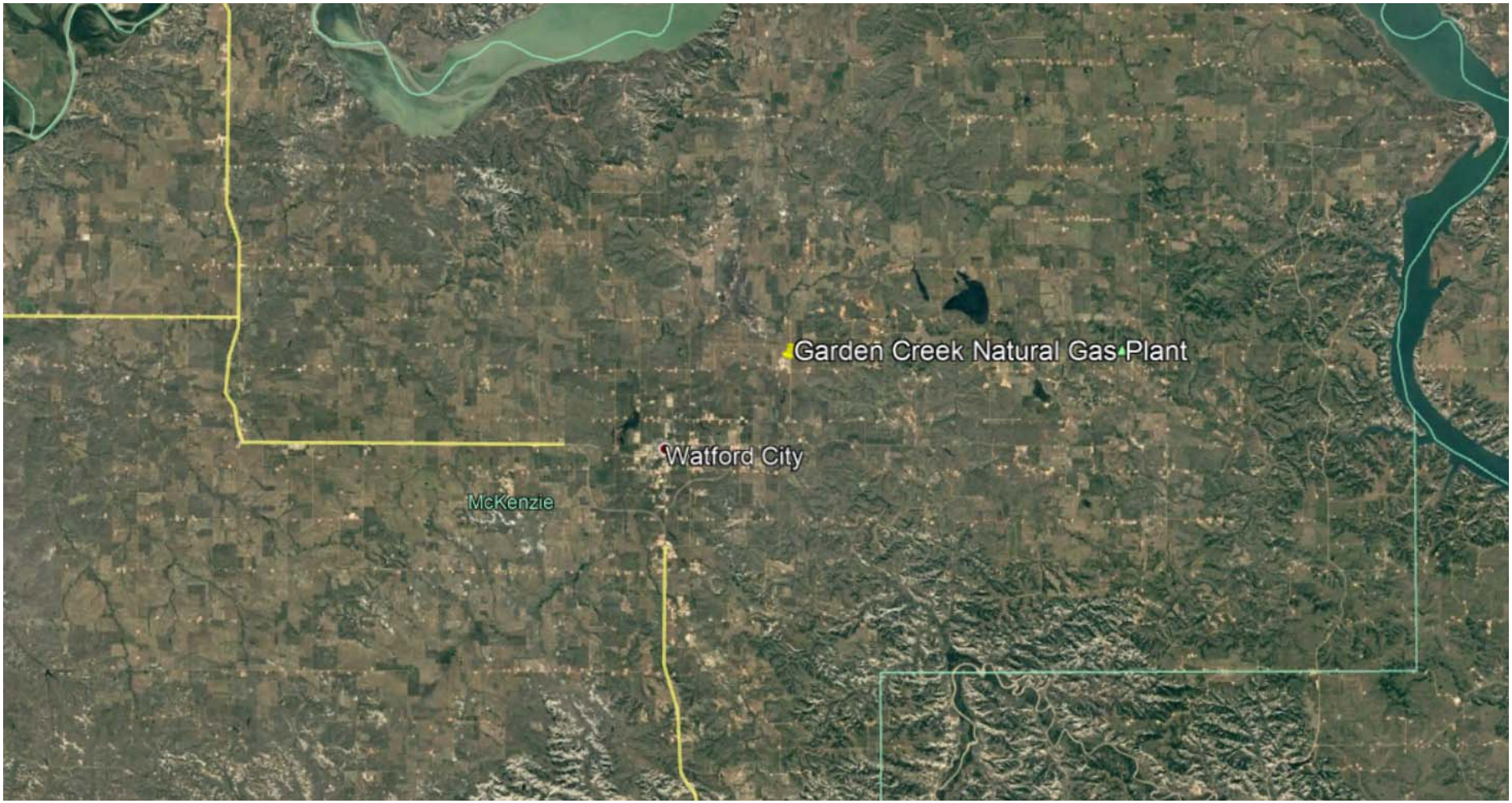


Figure Title: **Area Map**	ONEOK Rockies Midstream, L.L.C. Garden Creek Gas Plant	McKenzie County, ND October 2020

APPENDIX B – EMISSIONS CALCULATIONS

ONEOK Rockies Midstream, L.L.C.
Garden Creek Gas Plant and Compressor Station
Facility Emissions Summary - Annual

Unit ID	Description	NOx	CO	VOC	SO_2	PM	HCHO	HAP	CO_2e
		TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY
Garden Creek Gas Plant									
EGEN-1	1,462-hp Caterpillar G3516C LE Emergency Generator	1.61	3.22	0.81	<0.01	0.03	0.56	0.62	333.06
EGEN-2	1,462-hp Caterpillar G3516C LE Emergency Generator	1.61	3.22	0.81	<0.01	0.03	0.56	0.62	333.06
EGEN-3	1,462-hp Caterpillar G3516C LE Emergency Generator	1.61	3.22	0.81	<0.01	0.03	0.56	0.62	333.06
H-1	61.5 MMBtu/hr Hot Oil Heater	26.25	22.05	1.44	0.16	2.00	0.02	0.49	31,542.67
H-1A	61.5 MMBtu/hr Hot Oil Heater	26.25	22.05	1.44	0.16	2.00	0.02	0.49	31,542.67
H-1B	61.5 MMBtu/hr Hot Oil Heater	26.25	22.05	1.44	0.16	2.00	0.02	0.49	31,542.67
H-2	6.7 MMBtu/hr Regen Gas Heater	2.86	2.40	0.16	0.02	0.22	<0.01	0.05	3,436.36
H-2A	6.7 MMBtu/hr Regen Gas Heater	2.86	2.40	0.16	0.02	0.22	<0.01	0.05	3,436.36
H-2B	6.7 MMBtu/hr Regen Gas Heater	2.86	2.40	0.16	0.02	0.22	<0.01	0.05	3,436.36
TK-COND-1	Condensate Tank Blanket Gas Vent	--	--	6.20	--	--	--	0.03	75.22
TK-COND-2	Condensate Tank Blanket Gas Vent	--	--	6.20	--	--	--	0.03	75.22
TK-COND-3	Condensate Tank Blanket Gas Vent	--	--	6.20	--	--	--	0.03	75.22
TK-PW-1A	400-bbl Produced Water Tank	--	--	1.87	--	--	--	0.15	3.79
TK-PW-1B	400-bbl Produced Water Tank	--	--	1.87	--	--	--	0.15	3.79
TK-PW-2A	400-bbl Produced Water Tank	--	--	1.87	--	--	--	0.15	3.79
TK-PW-2B	400-bbl Produced Water Tank	--	--	1.87	--	--	--	0.15	3.79
TK-PW-3A	400-bbl Produced Water Tank	--	--	1.87	--	--	--	0.15	3.79
TK-PW-3B	400-bbl Produced Water Tank	--	--	1.87	--	--	--	0.15	3.79
TK-SLOP-1	150-bbl Produced Slop Oil Tank	--	--	0.62	--	--	--	0.05	1.26
TK-SLOP-2	150-bbl Produced Slop Oil Tank	--	--	0.62	--	--	--	0.05	1.26
TK-SLOP-3	150-bbl Produced Slop Oil Tank	--	--	0.62	--	--	--	0.05	1.26
TK-SWV-1	17-bbl Slop Water Vessels	--	--	0.09	--	--	--	0.01	0.18
TK-SWV-2	17-bbl Slop Water Vessels	--	--	0.09	--	--	--	0.01	0.18
TK-SWV-3	17-bbl Slop Water Vessels	--	--	0.09	--	--	--	0.01	0.18
TK-METH1	300-bbl Methanol Tank	--	--	0.28	--	--	--	0.28	--
TK-METH2	300-bbl Methanol Tank	--	--	0.28	--	--	--	0.28	--
TK-METH3	300-bbl Methanol Tank	--	--	0.28	--	--	--	0.28	--
TL-1	Truck Loading	--	--	3.69	--	--	--	0.67	1.91
TL-2	Truck Loading	--	--	3.69	--	--	--	0.67	1.91
TL-3	Truck Loading	--	--	3.69	--	--	--	0.67	1.91
FL-1	Plant Flare	9.59	43.10	13.49	2.24	0.01	<0.01	0.08	18,856.49
FL-2	Plant Flare	9.59	43.10	13.49	2.24	0.01	<0.01	0.08	18,856.49
FL-3	Plant Flare	9.59	43.10	13.49	2.24	0.01	<0.01	0.08	18,856.49
FL-4	*SVE Vapor Combustion Unit*	*2.24*	*5.27*	*13.85*	*0.01*	*0.02*	*<0.01*	*1.83*	*3,672.49*
FUG-2	Fugitive Emissions Subject to NSPS Subpart KKK	--	--	16.45	--	--	--	1.49	248.06
FUG-3	Fugitive Emissions Exempt from NSPS	--	--	18.56	--	--	--	0.36	497.46
FUG-5	Fugitive Emissions Subject to NSPS Subpart OOOO	--	--	12.69	--	--	--	1.04	209.77
Garden Creek Compressor Station									
CS-TK-1	400-bbl Condensate Tank - revised	--	--	9.67	--	--	--	0.78	19.13
CS-TK-2	400-bbl Condensate Tank - revised	--	--	9.67	--	--	--	0.78	19.13
CS-TK-4	400-bbl Condensate Tank - revised	--	--	9.67	--	--	--	0.78	19.13
CS-TL-1	Condensate Truck Loading - revised	--	--	14.80	--	--	--	2.68	12.51
CS-TK-3	210-bbl Methanol Tank	--	--	0.14	--	--	--	0.14	--
CS-FL-1	Compressor Station Emergency Flare	0.06	0.21	0.21	0.01	<0.01	<0.01	<0.01	102.45
CS-FUG-2	Fugitive Emissions Subject to NSPS Subpart KKK	--	--	3.11	--	--	--	0.08	79.69
CS-FUG-3	Fugitive Emissions Exempt from NSPS	--	--	7.03	--	--	--	0.21	176.16
CS-BD	Miscellaneous Venting and Blowdowns to Atmosphere	--	--	13.14	--	--	--	0.08	381.04
	Total =	**123.24**	**217.81**	**220.57**	**7.26**	**6.78**	**1.76**	**18.00**	**168,201.26**

Notes:
1) Miscellaneous venting and blowdowns to atmosphere include, but are not limited to, miscellaneous planned and unplanned venting to atmosphere from pressure relief valves, startup, shut-down, maintenance, compressor blowdowns, pigging actions, and/or pneumatic controllers.

ONEOK Rockies Midstream
Garden Creek Gas Plant
Flare Information and Emission Factors

Equipment Information	
	FL-4
Description	SVE Vapor Combustion Unit
VOC to Flare (lb/hr)	157.24
Stream Heat Content (Btu/scf)	122
Stream Net Btu Value (Btu/hr)	3,061,864
Operating Hours	8,760
Control Efficiency	98%
Pilot Stream Heat Content (Btu/scf)	1,026
Pilot Gas Flow Rate (scfh)	3,021.44
Pilot Gas Capacity (mmBtu/hr)	3.100
Pilot Operating Hours	8,760

AP-42/EPA Emission Factors			
	Flare Stream		**Pilot Gas**
NOx (lb/mmBtu)	0.068	**NOx (lb/mmscf)**	100.0
CO (lb/mmBtu)	0.31	**CO (lb/mmscf)**	84.0
VOC	Mass Balance	**VOC (lb/mmscf)**	5.5
SO_2	Stoichiometric	**SO_2 (lb/mmscf)**	0.6
$PM_{10/2.5}$	--	**$PM_{10/2.5}$ (lb/mmscf)**	1.9
PM_{COND}	--	**PM_{COND} (lb/mmscf)**	5.7
PM_{TOT}	--	**PM_{TOT} (lb/mmscf)**	7.6
Formaldehyde	--	**Formaldehyde (lb/mmscf)**	7.50E-02
n-Hexane	Mass Balance	**n-Hexane (lb/mmscf)**	1.80E+00
Benzene	Mass Balance	**Benzene (lb/mmscf)**	2.10E-03
Toluene	Mass Balance	**Toluene (lb/mmscf)**	3.40E-03
Ethylbenzene	Mass Balance	**Ethylbenzene**	--
Xylenes	Mass Balance	**Xylenes**	--
Other HAP	Mass Balance	**Other HAP (lb/mmscf)**	1.90E-03
Carbon Dioxide (CO_2) (kg/mmBtu)	53.06/Mass Balance	**Carbon Dioxide (CO_2) (kg/mmBtu)**	53.06
Methane (CH_4) (kg/mmBtu)	0.001/Mass Balance	**Methane (CH_4) (kg/mmBtu)**	1.00E-03
Nitrous Oxide (N_2O) (kg/mmBtu)	1.00E-04	**Nitrous Oxide (N_2O) (kg/mmBtu)**	1.00E-04

Notes:
1) NOx and CO emission factors (lb/mmBtu), flare stream: AP-42, Table 13.5-1 (2/2018). Pilot criteria and HAP emission factors (lb/mmscf): AP-42, Table 1.4-1, -2 (7/98). GHG emission factors (kg/mmBtu): 40 CFR 98.

ONEOK Rockies Midstream
Garden Creek Gas Plant
Flare Emissions Calculations

Unit ID: **FL-4**

Total: Stream + Pilot

Pollutant	Hourly Emissions		Annual Emissions	
NOx	0.51	lb/hr	2.24	TPY
CO	1.20	lb/hr	5.27	TPY
VOC	3.16	lb/hr	13.85	TPY
SO_2	<0.01	lb/hr	0.01	TPY
$PM_{10/2.5}$	0.01	lb/hr	0.03	TPY
PM_{COND}	0.02	lb/hr	0.08	TPY
PM_{TOT}	0.02	lb/hr	0.10	TPY
Formaldehyde	<0.01	lb/hr	<0.01	TPY
n-Hexane	0.42	lb/hr	1.83	TPY
Benzene	<0.01	lb/hr	<0.01	TPY
Toluene	<0.01	lb/hr	<0.01	TPY
Ethylbenzene	0.00	lb/hr	0.00	TPY
Xylenes	0.00	lb/hr	0.00	TPY
Other HAP	<0.01	lb/hr	<0.01	TPY
CO_2	837.72	lb/hr	3,669.23	TPY
CH_4	0.01	lb/hr	0.06	TPY
N_2O	<0.01	lb/hr	0.01	TPY

Stream Emissions

Pollutant	Emission Factor			Capacity			Conversion			Hourly Emissions			Operating Hours			Conversion			Annual Emissions	
NOx	6.80E-02	lb/mmBtu	X	3.06E+00	mmBtu/hr	X	-	-	=	0.21	lb/hr	X	8,760	X	0.0005	ton/lb	=	0.91	TPY
CO	3.10E-01	lb/mmBtu	X	3.06E+00	mmBtu/hr	X	-	-	=	0.95	lb/hr	X	8,760	X	0.0005	ton/lb	=	4.16	TPY
VOC	-	-	-	-	-	-	-	-	=	3.14	lb/hr	X	8,760	X	0.0005	ton/lb	=	13.77	TPY
SO_2	-	-	-	-	-	-	-	-	=	0.00	lb/hr	X	8,760	X	0.0005	ton/lb	=	0.00	TPY
n-Hexane	-	-	-	-	-	-	-	-	=	0.41	lb/hr	X	8,760	X	0.0005	ton/lb	=	1.81	TPY
Benzene	-	-	-	-	-	-	-	-	=	<0.01	lb/hr	X	8,760	X	0.0005	ton/lb	=	<0.01	TPY
Toluene	-	-	-	-	-	-	-	-	=	0.00	lb/hr	X	8,760	X	0.0005	ton/lb	=	0.00	TPY
Ethylbenzene	-	-	-	-	-	-	-	-	=	0.00	lb/hr	X	8,760	X	0.0005	ton/lb	=	0.00	TPY
Xylenes	-	-	-	-	-	-	-	-	=	0.00	lb/hr	X	8,760	X	0.0005	ton/lb	=	0.00	TPY
Other HAP	-	-	-	-	-	-	-	-	=	0.00	lb/hr	X	8,760	X	0.0005	ton/lb	=	0.00	TPY
CO_2	5.31E+01	kg/mmBtu	X	3.06E+00	mmBtu/hr	X	2.20462	lb/kg	=	358.17	lb/hr	X	8,760	X	0.0005	ton/lb	=	1,568.78	TPY
CO_2	-	-	-	-	-	-	-	-	=	116.93	lb/hr	X	8,760	X	0.0005	ton/lb	=	512.13	TPY
CH_4	1.00E-03	kg/mmBtu	X	3.06E+00	mmBtu/hr	X	2.20462	lb/kg	=	0.01	lb/hr	X	8,760	X	0.0005	ton/lb	=	0.03	TPY
CH_4	-	-	-	-	-	-	-	-	=	0.00	lb/hr	X	8,760	X	0.0005	ton/lb	=	0.00	TPY
N_2O	1.00E-04	kg/mmBtu	X	3.06E+00	mmBtu/hr	X	2.20462	lb/kg	=	<0.01	lb/hr	X	8,760	X	0.0005	ton/lb	=	<0.01	TPY

Pilot Emissions

Pollutant	Emission Factor			Capacity			Conversion			Hourly Emissions			Operating Hours			Conversion			Annual Emissions	
NOx	1.00E+02	lb/mmscf	X	3.02E-03	mmscf/hr	X	-	-	=	0.30	lb/hr	X	8,760	X	0.0005	ton/lb	=	1.32	TPY
CO	8.40E+01	lb/mmscf	X	3.02E-03	mmscf/hr	X	-	-	=	0.25	lb/hr	X	8,760	X	0.0005	ton/lb	=	1.11	TPY
VOC	5.50E+00	lb/mmscf	X	3.02E-03	mmscf/hr	X	-	-	=	0.02	lb/hr	X	8,760	X	0.0005	ton/lb	=	0.07	TPY
SO_2	6.00E-01	lb/mmscf	X	3.02E-03	mmscf/hr	X	-	-	=	<0.01	lb/hr	X	8,760	X	0.0005	ton/lb	=	0.01	TPY
$PM_{10/2.5}$	1.90E+00	lb/mmscf	X	3.02E-03	mmscf/hr	X	-	-	=	0.01	lb/hr	X	8,760	X	0.0005	ton/lb	=	0.03	TPY
PM_{COND}	5.70E+00	lb/mmscf	X	3.02E-03	mmscf/hr	X	-	-	=	0.02	lb/hr	X	8,760	X	0.0005	ton/lb	=	0.08	TPY
PM_{TOT}	7.60E+00	lb/mmscf	X	3.02E-03	mmscf/hr	X	-	-	=	0.02	lb/hr	X	8,760	X	0.0005	ton/lb	=	0.10	TPY
Formaldehyde	7.50E-02	lb/mmscf	X	3.02E-03	mmscf/hr	X	-	-	=	<0.01	lb/hr	X	8,760	X	0.0005	ton/lb	=	<0.01	TPY
n-Hexane	1.80E+00	lb/mmscf	X	3.02E-03	mmscf/hr	X	-	-	=	0.01	lb/hr	X	8,760	X	0.0005	ton/lb	=	0.02	TPY
Benzene	2.10E-03	lb/mmscf	X	3.02E-03	mmscf/hr	X	-	-	=	<0.01	lb/hr	X	8,760	X	0.0005	ton/lb	=	<0.01	TPY
Toluene	3.40E-03	lb/mmscf	X	3.02E-03	mmscf/hr	X	-	-	=	<0.01	lb/hr	X	8,760	X	0.0005	ton/lb	=	<0.01	TPY
Other HAP	1.90E-03	lb/mmscf	X	3.02E-03	mmscf/hr	X	-	-	=	<0.01	lb/hr	X	8,760	X	0.0005	ton/lb	=	<0.01	TPY
CO_2	5.31E+01	kg/mmBtu	X	3.10E+00	mmBtu/hr	X	2.20462	lb/kg	=	362.63	lb/hr	X	8,760	X	0.0005	ton/lb	=	1,588.32	TPY
CH_4	1.00E-03	kg/mmBtu	X	3.10E+00	mmBtu/hr	X	2.20462	lb/kg	=	0.01	lb/hr	X	8,760	X	0.0005	ton/lb	=	0.03	TPY
N_2O	1.00E-04	kg/mmBtu	X	3.10E+00	mmBtu/hr	X	2.20462	lb/kg	=	<0.01	lb/hr	X	8,760	X	0.0005	ton/lb	=	<0.01	TPY

ONEOK Rockies Midstream
Garden Creek Gas Plant
Flare Emissions Calculations - Flare Stream Analysis

Unit ID: **FL-4**

Component	Molecular Weight	Stream 1 SVE Stream		Total Streams Burned in Flare					Net Heating Value	Net Btu Rate
		2.52E+04	scfh	Uncontrolled		scfd	Controlled			
		Mole %	lb/hr	lb/hr	TPY		lb/hr	TPY	Btu/scf	Btu/hr
Water	18.0153	0.900%	10.77	10.77	47.17	5,443	10.77	47.17	0.00	0
Hydrogen Sulfide	34.081	0.000%	0.00	0.00	0.00	0	0.00	0.00	586.80	0
Carbon Dioxide	44.010	4.000%	116.93	116.93	512.13	24,192	116.93	512.13	0.00	0
Nitrogen	28.013	77.900%	1449.46	1449.46	6348.64	471,139	1449.46	6348.64	0.00	0
Helium	4.003	0.000%	0.00	0.00	0.00	0	0.00	0.00	0.00	0
Oxygen	31.999	13.900%	295.43	295.43	1293.97	84,067	295.43	1293.97	0.00	0
Methane	16.043	0.000%	0.00	0.00	0.00	0	0.00	0.00	909.40	0
Ethane	30.069	0.000%	0.00	0.00	0.00	0	0.00	0.00	1,618.70	0
Propane	44.096	0.000%	0.00	0.00	0.00	0	0.00	0.00	2,314.90	0
i-Butane	58.122	0.700%	27.02	27.02	118.36	4,234	0.54	2.37	3,000.40	529,271
n-Butane	58.122	0.000%	0.00	0.00	0.00	0	0.00	0.00	3,010.80	0
i-Pentane	72.149	1.000%	47.92	47.92	209.90	6,048	0.96	4.20	3,699.00	932,148
n-Pentane	72.149	1.000%	47.92	47.92	209.90	6,048	0.96	4.20	3,706.90	934,139
n-Hexane	86.175	0.360%	20.61	20.61	90.25	2,177	0.41	1.81	4,403.80	399,513
Other Hexanes	86.175	0.240%	13.74	13.74	60.17	1,452	0.27	1.20	4,403.80	266,342
Heptanes	100.202	0.000%	0.00	0.00	0.00	0	0.00	0.00	5,100.00	0
Benzene	78.114	0.001%	0.03	0.03	0.11	3	0.00	0.00	3,590.90	452
Toluene	92.141	0.000%	0.00	0.00	0.00	0	0.00	0.00	4,273.60	0
Ethylbenzene	106.167	0.000%	0.00	0.00	0.00	0	0.00	0.00	4,970.50	0
Xylenes	106.167	0.000%	0.00	0.00	0.00	0	0.00	0.00	4,957.10	0
Octanes	114.229	0.000%	0.00	0.00	0.00	0	0.00	0.00	5,796.00	0
2,2,4-Trimethylpentane	114.231	0.000%	0.00	0.00	0.00	0	0.00	0.00	5,778.80	0
Nonanes	128.255	0.000%	0.00	0.00	0.00	0	0.00	0.00	6,493.20	0
Decanes	142.282	0.000%	0.00	0.00	0.00	0	0.00	0.00	7,189.60	0
Totals =		**100.0%**	**2029.82**	**2029.82**	**8890.61**	**604,803**	**--**	**--**	**--**	**3,061,864**
Total VOC =		**3.301%**	**157.24**	**157.24**	**688.69**	**--**	**3.14**	**13.77**	**Heat Value (Btu/scf)**	**122**
Total HAP =				**20.63**	**90.37**	**--**	**0.41**	**1.81**		
Total H_2S=				**0.00**	**0.00**	**--**	**0.00**	**0.00**		
MW of Stream =						**30.56**				

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